National Institute of Environmental Health Sciences

Short term effect of rainfall on suspected malaria episodes at Magaria, Niger: A time series study

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Year: 2011
Journal: Transactions of The Royal Society of Tropical Medicine and Hygiene. 105 (11): 637-643

Abstract:

Epidemiological patterns of malaria are influenced by different kinds of climate. In Sahelian countries, the link between climatic factors and malaria is still insufficiently quantified. The aim of this work was to conduct a time-series study of rainfall to estimate the increased risk of malaria morbidity. Daily suspected malaria episodes among subjects of all ages were collected retrospectively in three health care facilities between 1 January 2000 and 31 December 2003 at Magaria, Niger. These daily numbers were analysed with time-series methods, using generalized additive models with a negative binomial family. The impact of rainfall 40 days before occurrence of suspected malaria episodes was studied using a distributed lag model. More than 13 000 suspected malaria episodes were registered corresponding to an annual cumulative incidence rate of 7.4%. The overall excess risk of suspected malaria episodes for an increase of 1mm of rainfall after 40 days of exposure was estimated at 7.2%. This study allowed to specify the excess risk of rainfall on the occurrence of suspected malaria episodes in an intermediate rainfall area located in the Sahelian region in Niger. It was a first step to a health impact assessment.

Source: http://dx.doi.org/10.1016/j.trstmh.2011.07.011

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban, Other Geographical Feature

Other Geographical Feature : sub-saharan; sahel

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Niger

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content